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Sinoniscus cavernicolus, a new genus and species of terrestrial isopod crustacean from a cave in China (Styloniscidae: Oniscidea)

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Abstract.—This is the first Oniscidea or terrestrial isopod crustacean recorded from a cave in the Peoples Republic of China. The cave where the new species of a new genus of Styloniscinae of Styloniscidae was collected is located near Guilin in Guangxi Province. The species is blind, pigmentless and well adapted to live in a cave.

Kwon & Taiti (1993) in their review and comprehensive account of 49 species of Oniscidea from southern China included no species of Styloniscidae (or of related Trichoniscidae) and no oniscidean specifically from a cave. This is the first record of a troglobitic oniscidean from China. The new genus is in Styloniscinae of Styloniscidae. The specialized oniscidean can be added to Kwon & Taiti's 23 "endemic species" from China (pg. 80). Kwon & Taiti described two blind Philosciidae, neither from a cave—*Papuaphiloscia granulata* and *P. arcangelii.*

Sinoniscus, new genus

Diagnosis.—Blind. Pigmentless. Frontal line distinct; supra-antennal line medially rounded (Fig. 1B). Three flagellar articles; middle article almost two times as long as proximal article; tiny apical article tipped with several long setae. Pereopods without marked sexual dimorphism. Pleon narrower than pereon with all neopleurons laterally appressed. Endopod of pleopod 1 with strong muscular attachment (Fig. 1E). Female with exopods of pleopods of segment 1 and of segment 2 of pleon firmly attached in single scale-like structure fitting across width of each segment (Figs. 3A,B).

Derivation and gender of name.—"Sino-" is a prefix for Chinese to which "-oniscus" is attached referring to an oniscidean from China. Masculine.

Type species.—*Sinoniscus cavernicolus*, new species. Type by original designation.

Affinities.—The new genus is in Styloniscidae because it has conspicuous, strong muscles connected to upper part of endopod of male pleopod 1 (Cf 1E and Vandel 1952: 11, fig. 6). The genital apophysis, although quite narrow, has a tiny apical cone or projection. The left mandible has 2 penicillate setae and the right has only one. The characters above are those on which Vandel (1952:95) defined Styloniscidae. However, Vandel stated that Styloniscidae had a "tête de type trichoniscien," or a head of the trichoniscid type. Vandel (1960:137) stated that in trichoniscids "la ligne frontale n'est pas différenciée (disparition probablement du à une regréssion)." The cephalon of the type of the new genus clearly has a well defined frontal line (Fig. 1B). The presence might represent the primitive state and perhaps it is regressed in contemporary forms, however, more knowledge about the shape of the cephalon of already known species must be obtained since most species of Styloniscidea (and of related Trichoniscidae) are described only on differences in morphology of mouth parts and male pleopods.

The new genus is in Styloniscinae of Styloniscidae because the dorsum is smooth and all neopleurons are appressed laterally on the pleon. All other characters of the new genus are more closely related to species of *Styloniscus* as described by Vandel (1952) who reviewed many species of that genus.

Remarks.—Schmalfuss (1989:21), after presenting a cladogram of family and higher than family clads of Oniscidea, stated that he could not find any characters which could be used to keep Styloniscoidea and Trichoniscoidea distinct. The superfamilies are separated essentially on the same characters as are the nominate families so species of Styloniscidae are closely related to those in Trichoniscidae. Most genera of trichoniscids with species adapted to cave life are in Vandel's (1960) Première Division (now Tribe) of Trichoniscinae. However, *Sinoniscus* (without reference to the muscles of the male pleopods or to the frontal line on the cephalon) fits most closely into Vandel's 'Deuxième Division' with exception that the elongate shaft (tige) projecting from the endopod of male pleopod 1 is not plumose as stated in Vandel's definition of the Deuxième Division (pp. 138, 151).

Sinoniscus is not related to the blind, monotypic *Thailandoniscus* Dalens (1989), a cave adapted styloniscid inhabiting water in caves in Thailand, as comparisons of the cephalons and male pleopods 2, among other things, immediately suggest. The new species described here was found on the mud floor of the cave. Dalens (1989:6) stated that the difference between Trichoniscidae and Styloniscidae is "d'ordre quantitatif et non qualitatif" and the families are distinguished solely "sur l'appareil mâle." Trichoniscidae contains about 86 valid genera and Styloniscidae contains about 11 valid genera. Five genera of Trichoniscidae based on only blind species were discussed by Schultz (1994). The two families must be reevaluated to determine if they can be merged into a monophyletic unit.

Sinoniscus cavernicolus, new species
Figs. 1–3

Description.—About two and one half times longer than broad, dorsum smooth. Anterolateral lobes large (Fig. 1B). Antenna 1 with article 3 longest and tipped with seven aesthetacs, apical one longest. Antenna 2 relatively short with long seta on distal peduncular segment. Right mandible with well developed molar; one seta and lacinia mobilis tipped with tiny teeth between molar and incisor. Incisor with two large, strong outer teeth with inner smaller teeth. Left mandible with well developed molar with two setae on lacinia mobilis; incisor with few teeth. Exopod of maxilla 1 with four outer teeth, one medial tooth and three inner short unnotched teeth; inner margin with tiny, plumose seta (Fig. 1O). Endopod of maxilla 1 tipped with three compound sensory setae, apical one knobed. Maxilla 2 narrows apically with rounded sensory edge, fringe of setae on medial margin. Maxilliped with palp of two segments; first short and broad; second with rounded outer margin ending in point, inner or medial margin straight with several paired setae and one large seta with accompanying shorter seta near apex. Endite narrows apically with large apical spine medial to short, setose apical segment. Exopod of maxilliped about one third length of maxilliped proper with rounded apex and setae filled indentation on outer margin.

All pereopods about same length and with simple setae on inner margins; all with scale-like setae on outer margin of propodus and carpus and scale of setae apically on outer margin of carpus and merus; hair-like setae distally on propodus and proximally on dactylus of each pereopod; each dactylus with single claw and brush-like dactylar organ. Male pereopod I with short dactylus, propodus with two inner setae and scale-like setae on outer edge; carpus with one especially long seta with three other long

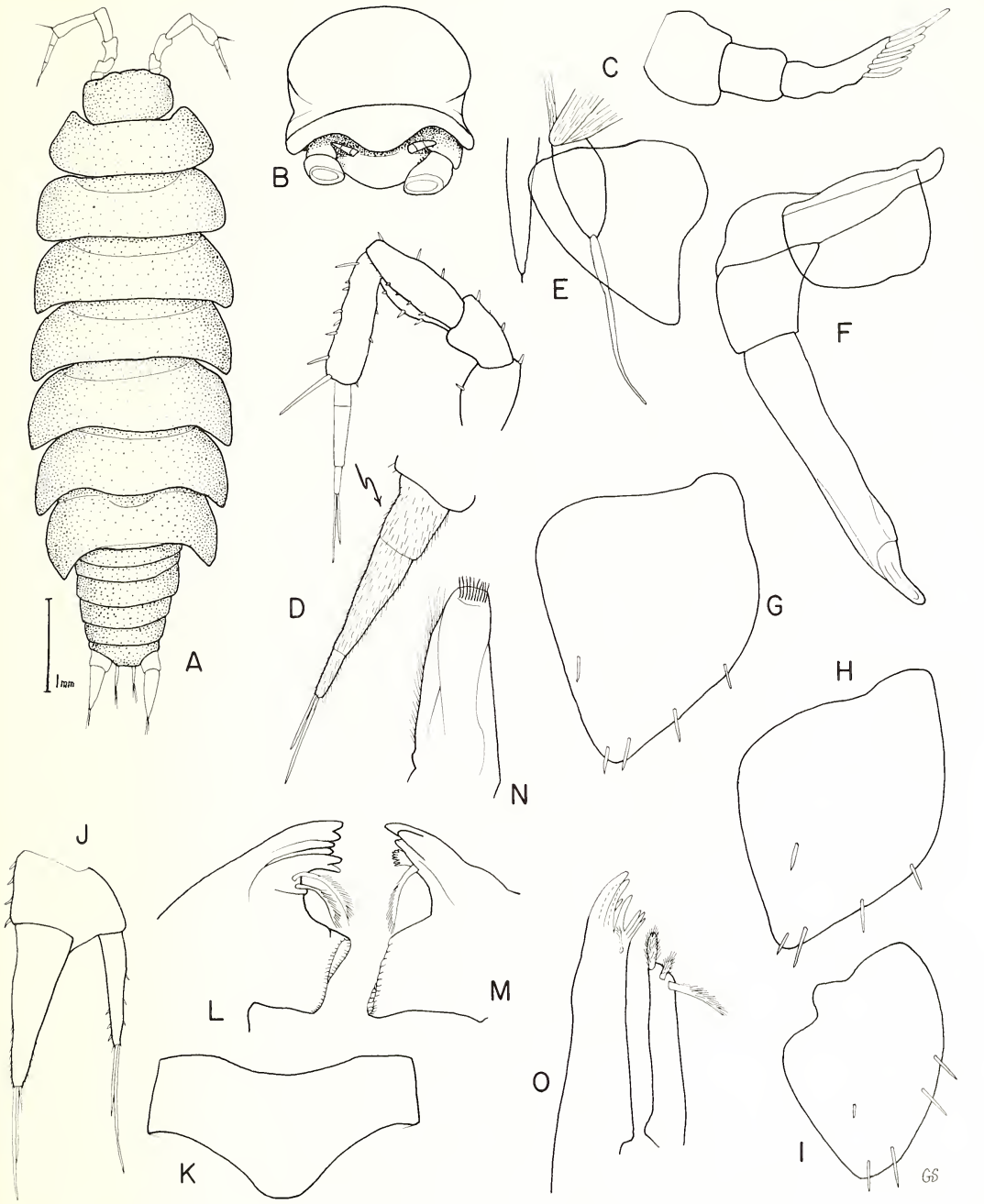

Fig. 1. *Sinoniscus cavernicolus,* new genus, new species: A, Holotype male 6.5 mm long; B, Frontal view cephalon; C, Antenna 1; D, Antenna 2 with detail of flagellum; E–I, Male pleopods 1–5 respectively; J, Uropod; K, Pleotelson; L, Left mandible; M, Right mandible; N, Maxilla 2; O, Maxilla 1.

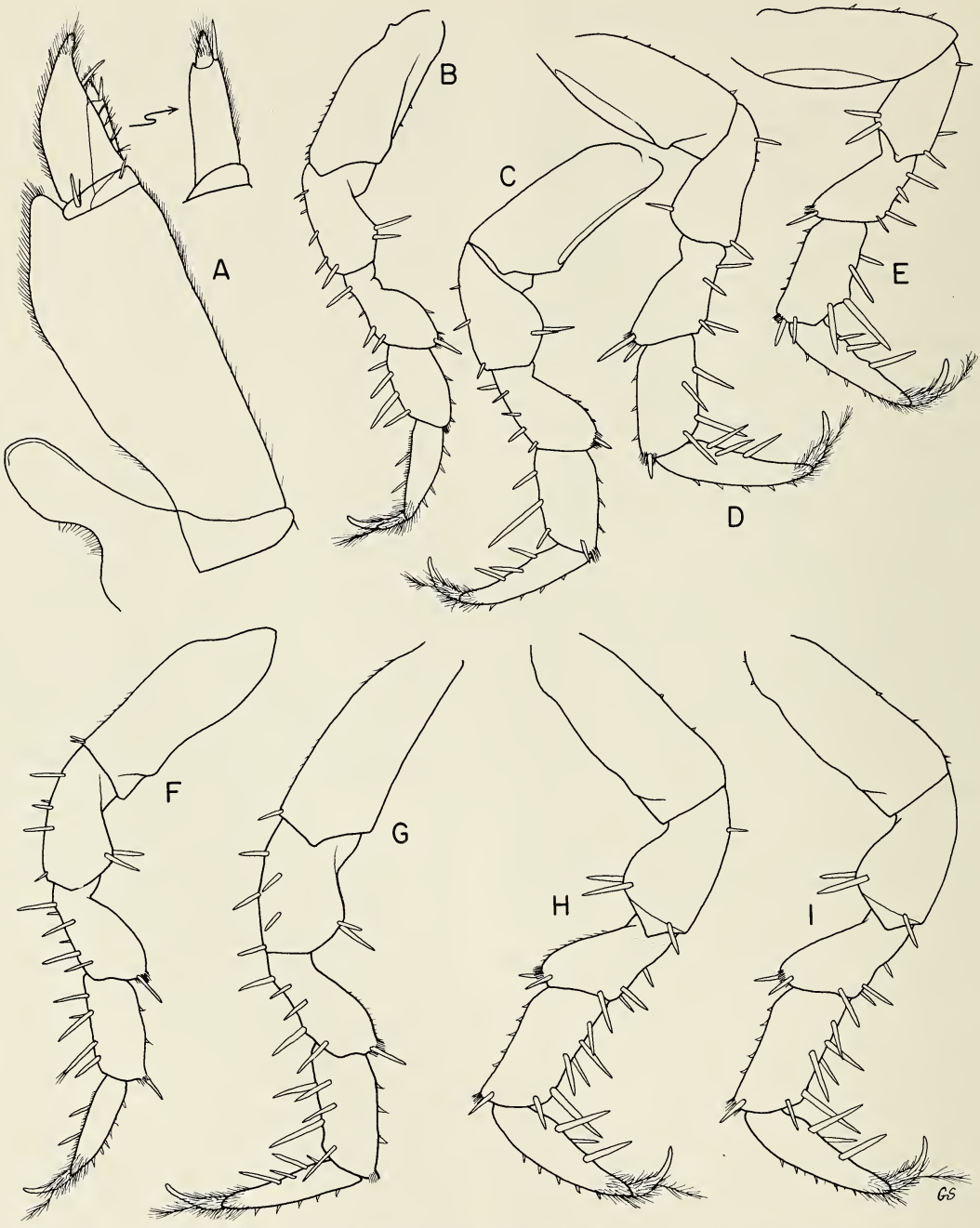

Fig. 2. *Sinoniscus cavernicolus*: A, Maxilliped with detail of endite; B–E, Male pereopods I, II, VI and VII respectively; F–I, Female pereopods I, II, VI and VII respectively.

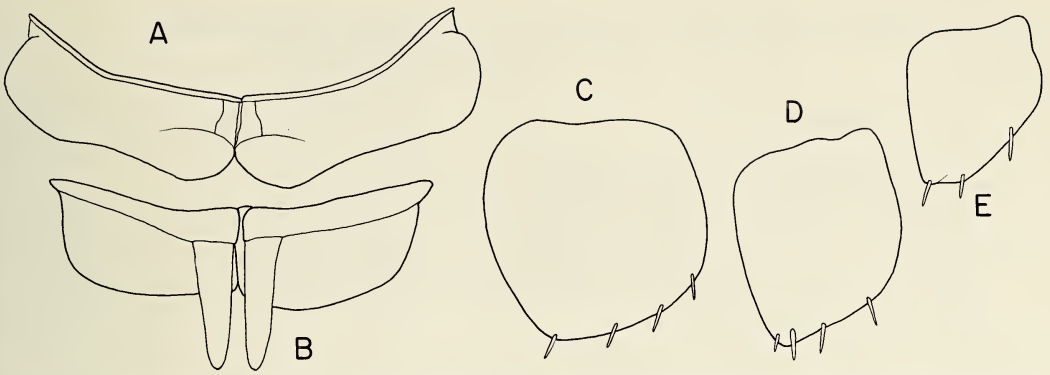

Fig. 3. *Sinoniscus cavernicolus*, allotype female: A, B, Pleopods underside segments 1 and 2 respectively; C–E, Exopod pleopods 3–5 respectively.

setae on inner margin; few setae on inner margin of merus and ischium. Male pereopod II with three long setae on inner margin of propodus; three, one very long, on inner margin of carpus; other segments with few setae on inner margins. Male pereopod VI with three long setae on inner margin; four on carpus; few on other segments. Male pereopod VII with three long setae on inner margin; carpus with six long setae, two on outer apical margin; few on other segments.

Narrow pleon with neopleurons not developed. Exopod of male pleopod 1 simple with pointed posterolateral border; endopod small tipped apically with long, nonplumose shaft, shaft about twice as long as basal segment (Fig. 1E). Exopod of male pleopod 2 small, about one and one half times as wide as long; endopod elongate with short proximal segment and second elongate segment about four times as long as proximal segment; second segment narrows apically, apex rounded (Fig. 1F). Male pleopods 3 to 5 simple, with marginal setae and one seta on face of exopod. Pleotelson, short, with rounded posterior border, no marginal scales or setae. Uropod with conical rami each extending beyond posterior point of pleotelson, both tipped with two long setae.

Pereopods of female much like those of male (Figs. 2F–I). Pleopods 1 in single elongate structure medially split into two lobes. Pleopods 2 with exopods and endopods narrow, elongate and medially located. Exopods of pleopods 3 to 5 of female much like those of male (Figs. 3A–E).

Materials examined.—Nine specimens (3 males and 6 nongravid females).

Measurements.—Males 6.5 to 6.8 mm long; females 6.8 to 7.2 mm long.

Type locality.—A cave at Taiping Yau, Lin Chuan County (just north of Guilin; Reed Flute Cave, a tourist cave, is nearby), Guangxi Province, Peoples Republic of China. Collected 1 Aug 1993 by D. A. Hubbard.

Ecology.—The species was taken from highly organic mud sediment on the floor of the cave.

Distribution.—Known only from the type locality.

Derivation of name.—The Latin *caverna* means "cave" and *-colus* means "dwelling in" so cavernicolus refers to its cave dwelling life style.

Deposition of types.—Holotype male, allotype female and paratypes (1 male and 3 females), Institute of Zoology, Academia Sinica, No. 940925; paratypes, 1 male 2 females. National Museum of Natural History, USNM 267281, Washington, D.C.

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